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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/551,273	04/18/2000	Nozomu Saito	9333/237	1986

757 7590 07/07/2003

BRINKS HOFER GILSON & LIONE
P.O. BOX 10395
CHICAGO, IL 60611

EXAMINER
LAO, LUN S

ART UNIT	PAPER NUMBER
2643	

DATE MAILED: 07/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/551,273	Applicant(s) SAITO ET AL.	
	Examiner Lun-See Lao	Art Unit 2643	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 April 2000* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Introduction

1. Claims 1-20 of U.S. Application 09/551,273 filed on 04/18/2000 are presented for examination.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 8 and 11-12, 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Romesburg (US PAT. 5,796,819).

Consider claim 8, Romesburg teaches a microphone system comprising two microphones (see fig.3 (22,36)) having directional characteristics, an adaptive filter that simulates a noise signal outputted from one microphone by using a noise signal outputted from the other microphone, and a calculation means that calculates a difference between these two noise signals, wherein the two microphones (22,36) are positioned substantially adjacently, and angles formed by the orientations of the microphones with respect to a speaker's vocalizing direction (T) are different for each of the microphones (see col.10 line 10-60).

Consider claims 11-12, Romesburg teaches a microphone system of further comprising a filter processing means that updates inherently (such as changing the tap) filter coefficients of the adaptive filter (see col.9 line 50-col.10 line 15); and the filter processing means receives a voice signal outputted from a microphone and a difference signal outputted from the calculation means, and updates inherently (such as changing

the tap) the filter coefficients of the adaptive filter so as to minimize a power of the difference signal by using the LMS algorithm (see col.9 line 50-col.10 line 15).

Consider claim 17, Romesburg teaches a microphone system comprising two microphones (see fig.3 (22,36)), an adaptive filter (42,14,40,32) that simulates a noise signal outputted from one microphone by using a noise signal outputted from the other microphone, and a calculation means (see col.10 line 10-60) that calculates a difference between these two noise signals, wherein one microphone (22) is disposed substantially directly above the face of a speaker (see col.10 line 10-60).

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claim 13 is rejected under 35 U.S.C. 102(e) as being anticipated by Handel (US PAT. 6,430,295).

Consider claim 13, Handel teaches a microphone system that executes an adaptive signal processing by using output signals from two microphones (see fig.4 (215, 225)) and outputs a speaker's voice signal with an improved SN ratio, wherein the microphones (215,225) are positioned close to one another, and the SN ratio of the output signal from one microphone is raised, while the SN ratio of the output signal from the other microphone is lowered (see col.5 lines 45-67).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1, 8 and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki (US PAT. 5,471,538).

Consider claim 1, Sasaki teaches a microphone system that executes an adaptive signal processing by using output signals from two microphones (see fig.2 (11,21)) and outputs a sound signal with an improved SN ratio (see col.1 line 59-col.2 line 3), the microphone system comprising two microphones (11,21) having directional characteristics, wherein the microphones are positioned relatively close to one another, and the angles (see fig.6) formed by the orientations of the microphones with respect to a sound signal direction are different for each of the microphones (see col.6 lines 13-28).

While Sasaki does not explicitly teach that the sound signal (sound coming from the direction of an object, col. 1, lines 8-16) (sound signal, col. 3, lines 1, 7, 56; col. 5, lines 27-37) is a speaker's voice, Sasaki teaches that the apparatus is a camcorder (col. 7, lines 58-64), which is typically used to record a speaker's voice. Therefore, it would have been obvious to include a speaker's voice into the sound signal of Sasaki. When the teaching is modified as such, the sound signal direction would have been the speaker's vocalizing direction.

Consider claim 8, Sasaki teaches a microphone system comprising two microphones having directional characteristics (see fig.3), an adaptive filter (see fig.2 (24)) that simulates a noise signal outputted from one microphone (21) by using a noise signal outputted from the other microphone (11), and a calculation means (see col.3 line 11-col.4 line 65) that calculates a difference between these two noise signals, wherein the two microphones (11,21) are positioned substantially adjacently, and angles (see fig.6) formed by the orientations of the microphones with respect to a speaker's vocalizing direction are different for each of the microphones (see col.6 line 13-28).

While Sasaki does not explicitly teach that the sound signal (sound coming from the direction of an object, col. 1, lines 8-16) (sound signal, col. 3, lines 1, 7, 56; col. 5, lines 27-37) is a speaker's voice, Sasaki teaches that the apparatus is a camcorder (col. 7, lines 58-64), which is typically used to record a speaker's voice. Therefore, it would have been obvious to include a speaker's voice into the sound signal of Sasaki. When the teaching is modified as such, the sound signal direction would have been the speaker's vocalizing direction.

Consider claims 11-12, Sasaki teaches a microphone system of further comprising a filter processing means that updates filter coefficients (weight vector) of the adaptive filter (see col.5 line 5-65); and the filter processing means receives a voice signal outputted from a microphone and a difference signal outputted from the calculation means, and updates the filter coefficients of the adaptive filter so as to minimize a power of the difference signal by using the LMS algorithm (see col.4 line 5-col.5 line 15).

Consider claim 13, Sasaki teaches a microphone system that executes an adaptive signal processing by using output signals from two microphones (see fig.2

(11,21)) and outputs a sound signal with an improved SN ratio (see col.3 line 55 –col.4 line 31), wherein the microphones (11,21) are positioned close to one another, and the SN ratio of the output signal from one microphone is raised (desired sound), while the SN ratio of the output signal from the other microphone is lowered ((desired sound) see col.1 line 61-col.2 line 31).

While Sasaki does not explicitly teach that the sound signal (sound coming from the direction of an object, col. 1, lines 8-16) (sound signal, col. 3, lines 1, 7, 56; col. 5, lines 27-37) is a speaker's voice, Sasaki teaches that the apparatus is a camcorder (col. 7, lines 58-64), which is typically used to record a speaker's voice. Therefore, it would have been obvious to include a speaker's voice into the sound signal of Sasaki. When the teaching is modified as such, the sound signal direction would have been the speaker's vocalizing direction.

8. Claims 2 and 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki (US PAT. 5,471,538) as applied to claim 1 in view of Walters (US PAT. 5,442,813).

Consider claim 2, Sasaki fails to disclose a microphone is mounted on the sun visor of a vehicle.

However, Walters teaches a microphone is mounted on the sun visor of a vehicle (see col.4 lines 6-23).

Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to combine the teaching of Sasaki with Walters to provide the microphone arranged close to the narrow side of the sun visor facing away from the speaker/listener at only a very small distance from the sun visor.

Consider claims 5-7, Walters teaches a microphone system wherein the orientation of one microphone is set to approximately coincide with the speaker's vocalizing direction / the angle formed by the orientation of one microphone with respect to the speaker's vocalizing direction is set to approximately 0 (speaker' mouth faces the microphone, fig.3). As to the orientation of one microphone facing toward the front passenger seat to form an angle of approximately 45 with respect to the speaker's vocalizing direction / angle formed by the orientation of the other microphone with respect to the speaker's vocalizing direction is set to approximately 45, the microphones of Walters (2, 3, 4) are mounted on the supporting rod 8 (see fig.s 2, 8). As the sun visor is rotated upwards and downwards on the hinge, the axes of the microphones move in the opposite direction over a wide range of angles with respect to the passenger/speaker (represented by direction 9) (fig.s 3 and 4 and denoting text). Obviously, 45 would have been formed during such rotations.

9. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki (US PAT. 5,471,538) as applied to claim 1 in view of Romesburg (US PAT. 5,796,819).

Consider claims 3-4, Sasaki fails to teach a microphone system of the microphones are mounted on the ceiling above the driver's seat of a vehicle; and the microphones are mounted on the ceiling above the front passenger seat of a vehicle.

However, Romesburg teaches a microphone system of the microphones (see fig.8 (22,36)) are mounted on near the ceiling above the driver's seat of a vehicle; and the microphones (see fig.8 (22,36)) are mounted on near the ceiling above the front passenger seat of a vehicle.

Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to combine the teaching of Sasaki with Romesburg to provide the microphone apparatus having better direction sound.

10. Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Romesburg (US PAT. 5,796,819) as applied to claim 8 in view of Walters (US PAT. 5,442,813).

Consider claim 9, Romesburg fails to disclose a microphone is mounted on the sun visor of a vehicle.

However, Walters teaches a microphone is mounted on the sun visor of a vehicle ((see col.4 lines 6-23).

Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to combine the teaching of Romesburg with Walters to provide the microphone arranged close to the narrow side of the sun visor facing away from the speaker/listener at only a very small distance from the sun visor.

Consider claim 10, Walter teaches a microphone system as the angle formed by the orientation of one microphone with respect to the speaker's vocalizing direction is set to approximately 0 (when the speaker's mouth face to the microphone (see fig.3)), and the angle formed by the orientation of the other microphone with respect to the speaker's vocalizing direction is set to approximately 45 (by adjusted sun visor (see fig.4, (8)).

11. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki (US PAT. 5,471,538) as applied to claim 13 in view of Lange (EP 457,176).

Consider claim 14, Sasaki fails to teach a microphone system of one microphone is disposed almost directly above the face of a speaker.

However, Lange teaches a microphone system wherein one microphone is disposed almost directly above the face of a speaker (see fig.1 (1a)).

Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to combine the teaching of Sasaki with Lange to provide the microphone apparatus having better direction sound.

Consider claims 15-16, Lange teaches a microphone system of the other microphone is spaced apart on the occipital side (see fig.1 (1b)) from the position of the one microphone (1a); and a microphone system of the other microphone is spaced apart on the occipital side (see fig.1 (1b) from the back seat) by about 1 to 5 cm from the position of the one microphone (1a from back of the car).

12. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Handel (US PAT. 6,430,295) as applied to claim 13 in view of Lange (EP 457,176).

Consider claim 14, Handel fails to teach a microphone system of one microphone is disposed almost directly above the face of a speaker.

However, Lange teaches a microphone system wherein one microphone is disposed almost directly above the face of a speaker (see fig.1 (1a)).

Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to combine the teaching of Handel with Lange to provide the microphone apparatus having better direction sound.

Consider claims 15-16, Lange teaches a microphone system of the other microphone is spaced apart on the occipital side (see fig.1 (1b)) from the position of the one microphone (1a); and a microphone system of the other microphone is spaced

apart on the occipital side (see fig.1 (1b) from the back seat) by about 1 to 5 cm from the position of the one microphone (1a from back of the car).

13. Claims 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Romesburg (US PAT. 5,796,819) as applied to claim 17 in view of Lange (EP 457,176)

Consider claims 18-19, Romesburg fails to teach a microphone system of the other microphone is spaced apart on the occipital side from the position of the one microphone; and a microphone system of the other microphone is spaced apart on the occipital side by about 1 to 5 cm from the position of the one microphone.

However, Lange teaches a microphone system wherein the other microphone is spaced apart on the occipital side (see fig.1 (1b)) from the position of the one microphone (1a); and a microphone system of the other microphone is spaced apart on the occipital side (see fig.1 (1b) from the back seat) by about 1 to 5 cm from the position of the one microphone (1a from back of the car).

Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to combine the teaching of Romesburg with Lange to provide the microphone apparatus having better noise canceler.

14. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Romesburg (US PAT. 5,796,819) as applied to claim 17 in view of Yoshida (US PAT. 5,473,702).

Consider claim 20, Romesburg fails to teach that a microphone system determines filter coefficients of the adaptive filter by an adaptive signal processing during a period of non-recognition of a voice, does not update the filter coefficients

during a period of recognition of a voice, and sets the filter coefficients determined during the non-recognition of a voice to the adaptive filter.

However, Yoshida teaches that a microphone system determines filter coefficients of the adaptive filter by an adaptive signal processing during a period of non-recognition of a voice, does not update the filter coefficients (such as control signal ck) during a period of recognition of a voice, and sets the filter coefficients determined during the non-recognition of a voice to the adaptive filter (col.8 line 30-col.9 line 6).

Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to combine the teaching of Romesburg with Yoshida to provide an echo canceller to enable a noise canceller to adapt automatically to changes in background noise level.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hatae (US PAT 5,675,655) is recited to show other related the microphone system.

16. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to: (703) 872-9314

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lao,Lun-See whose telephone number is (703) 305-2259 The examiner

can normally be reached on Monday-Friday from 8:00 to 6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz, can be reached on (703) 305-4708.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 whose telephone number is (703) 306-0377.

Lao, Lun-See
Patent Examiner
US Patent and Trademark Office
Crystal Park 2
(703305-2259

DUC NGUYEN
PRIMARY EXAMINER